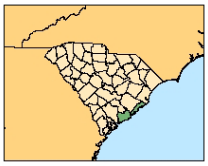
CHARLESTON COUNTY, SC

Hazard Profile for 2008

An Excerpt from the State of South Carolina Hazard Assessment for 2008



I. Summary

Charleston County is vulnerable to both natural (hurricanes/tropical storm) and technological (hazardous material incidents) hazards. Hurricane/tropical storms produce the greatest monetary damage; however, the recurrence interval is 7.9 years, making it a relatively infrequent event. Coastal hazards (ocean surf and erosion) are more frequent and contributed 46% of the losses for the county. Wildfires, thunderstorms, lightning, hail, and hazardous material incidents are some of the prominent hazards that regularly affect the county, based on past occurrences.

II. Social Vulnerability

Social vulnerability examines the socioeconomic and demographic character of places and helps to explain the variation in the population's ability to prepare for and respond to hazards. The Social Vulnerability Index (SoVI) is a statistical measure that compares social vulnerability to environmental hazards among places, and then visually displays these comparisons on a map. SoVI thus illustrates where there is uneven capacity for preparedness and response and where additional planning and response resources might be used most effectively to help residents. The variables used in determining the Social Vulnerability (SoVI) score along with how SoVI is calculated are available on the Hazards and Vulnerability Research Institute SoVI website (http://www.sovius.org).

Within Charleston County, most of the census tracts exhibit moderate levels of social vulnerability. Census tracts in North Charleston and in Edisto Island have the highest SoVI scores, or elevated levels of social vulnerability. Figure 1 provides maps of the Charleston County depicting (on the left) social vulnerability by census tract and (on the right) cities and major roads.

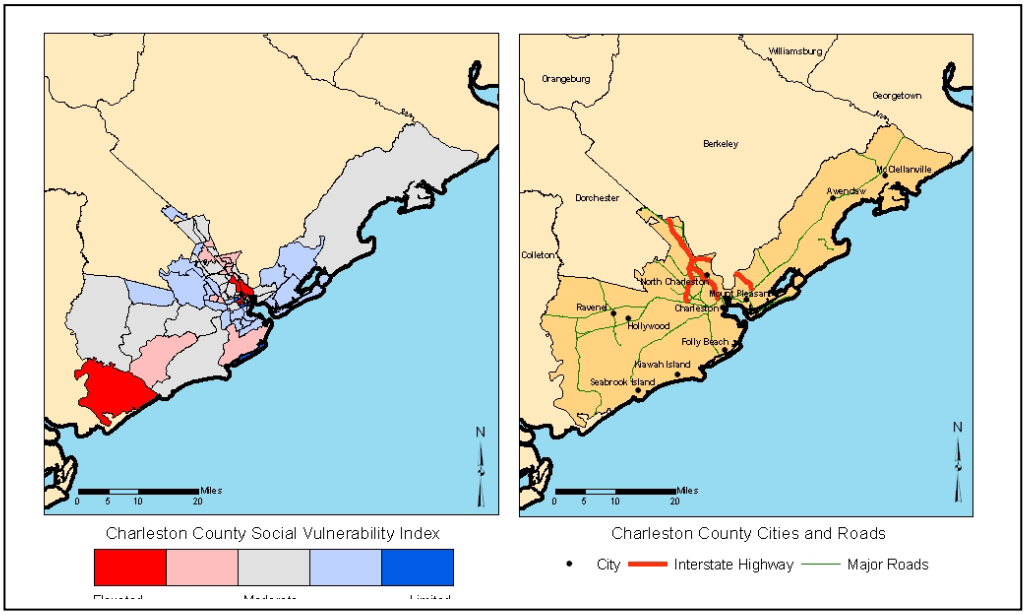


FIGURE 1. The Social Vulnerability for Charleston County, SC by US Census tracts.

III. Terms

Disaster – a singular hazard event that results in widespread human losses or has profound impacts on local environments.

Frequency – a calculated number showing the chance of an event occurring each year based on the historic record.

Hazard – the potential threat to humans as well as the impact of an event on society and the environment.

Recurrence – a calculated number that examines the expected time interval between events based on the historic record.

Risk – the likelihood or probability of occurrence of a hazard or adverse event.

Vulnerability – the potential for loss or the capacity to suffer harm from a hazard event.

South Carolina Emergency Management Division -
Mitigation Division
E-mail: mberry@emd.sc.gov
http://www.scemd.org

Hazard & Vulnerability Research Institute
University of South Carolina
E-mail: scutter.sc.edu
http://webra.cas.sc.edu/hvri

IV. Hazard Identification

The estimated recurrence of a hazard is a useful element (based on event frequency) for distinguishing between infrequent hazards like earthquakes, and frequent hazards such as hazardous materials incidents or traffic accidents. The most common hazard events in Charleston County are hazardous material accidents, severe thunderstorms and wind, hail, lightning, and wildfires. Winter weather has the lowest recurrence intervals. The recurrence and hazard frequency table can be seen in Table 1.

TABLE 1. The Hazard Profile for Charleston County, SC.

Hazard[a]	Number of Events	Years in Record	Recurrence Interval (Years)	Hazard Frequency (Percent Chance per Year)
Coastal Events				
Hurricane/Tropical Storm	20	158	7.9	12.66
Ocean & Lake Surf[b]	13	16	1.23	81.25
Waterspout	17	16	0.94	106.25**
Dam Failure	-	-	-	-
Drought	20	59	2.95	33.90
Flood	77	59	0.77	130.51**
Fog	0	12	*	*
Geophysical Events				
Avalanche	0	49	*	*
Earthquake	34	310	9.12	10.97
Landslide	0	49	*	*
Human-Induced Events				
Civil Disturbance	-	-	-	-
Hazardous Materials (Hazmat)	2685	22	<0.50	12,204.55**
Nuclear Power Plant	0	8	*	*
Terrorism	0	29	*	*
Transportation (Motor Vehicle)	108,881	10	<0.50	108,8810.00**
Severe Thunderstorm Events				
Funnel Cloud	6	16	2.67	37.50
Hail	175	59	<0.50	296.61**
Heavy Precipitation	1	15	15.00	6.67
Lightning	17	16	0.94	106.25**
Thunderstorm & Wind	255	59	<0.50	432.20**
Tornado	38	59	1.55	64.41
Temperature Extremes	10	16	1.60	62.50
Wildfire	2,043	21	<0.50	9,728.57**
Winter Weather (Snow & Ice)	4	59	14.75	6.78

[a] Data Sources: National Climatic Data Center (www.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwEvent~Storm); National Geophysical Data Center (www.ngdc.noaa.gov/hazard/

[b] Includes coastal flooding, coastal erosion, coastal winds

* Unable to calculate (cannot divide by zero)

** Percent is greater than 100.00, therefore hazard can be expected to occur more than once per year

\- Data Unavailable

V. Hazard Loss Information

When compared to South Carolina as a whole, Charleston County has a higher probability of loss-producing coastal, hurricane/tropical storm, drought, flooding, heat, lightning, thunderstorm, wind, and tornado events. This comparison between the county and state in Figure 2 (page 3) shows hazards that exceeded the state mean in red type. Winter weather is well below the state mean indicating that this hazard has historically produced fewer losses for the county when compared to the state as a whole.

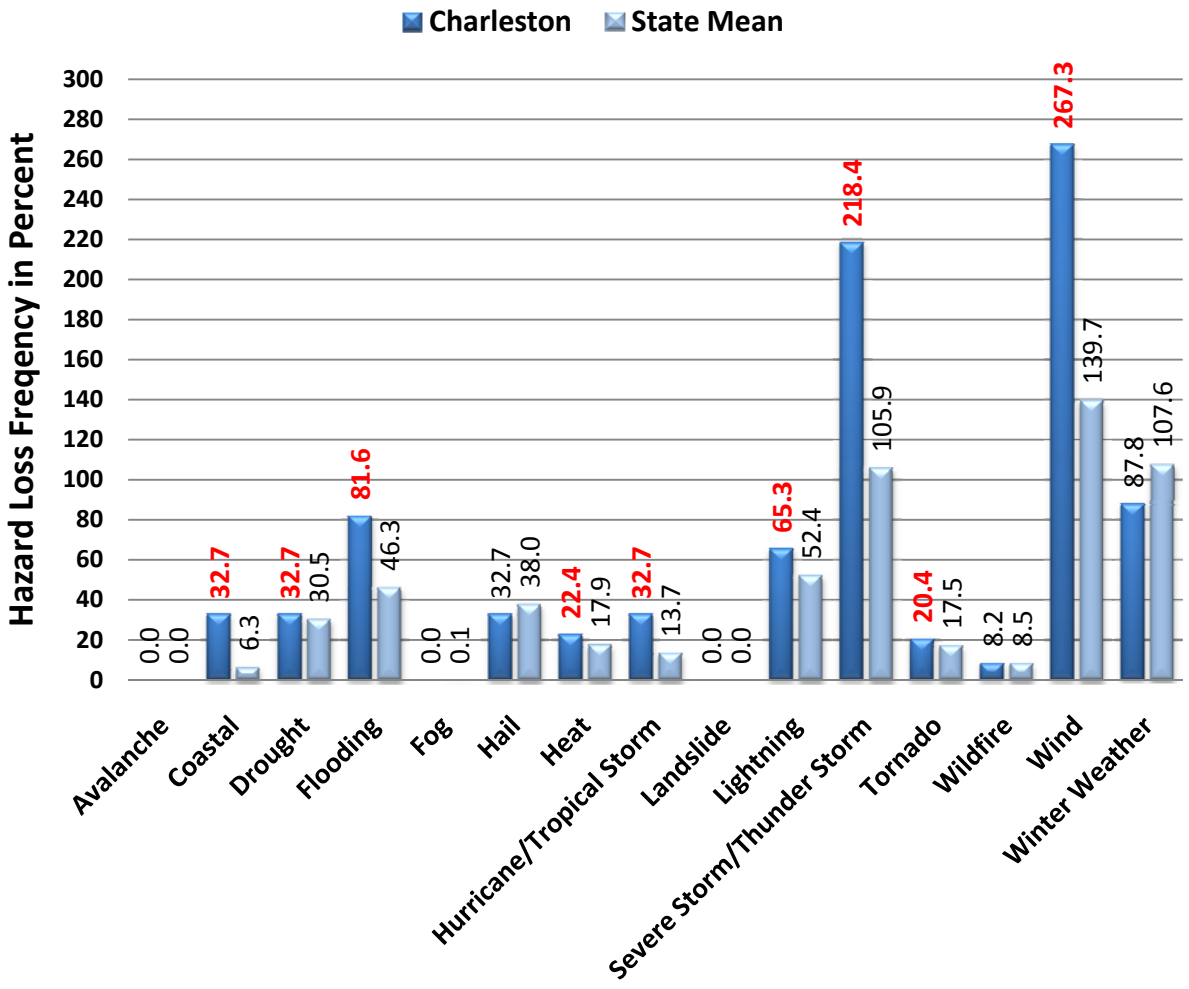


FIGURE 2. The historic loss causing hazard frequency between 1960 and 2008 for Charleston County compared to South Carolina as reported in SHELDUS. Percentage numbers indicated in red are when the county total exceeds the state mean. Also, a hazard that is identified in the National Climatic Data Center Storm Data reports as a multiple event hazard (flooding, winter weather, coastal storm), and given a statewide or regional location, the impact of the event is equally distributed amongst the counties involved.

Another way of determining how vulnerable a county is to particular hazards is by examining the amount of damage caused by past events. In Figure 3 (page 4), the cumulative amount of damage from 1960 to 2008 based on twelve hazard types is computed from the Hazards and Vulnerability Research Institute's SHELDUS database (available at http://www.sheldus.org). The historic losses in Charleston County exceed $1.9 billion, and are largely due to hurricanes and tropical storms, followed by coastal. Hurricane/tropical storm represented 50% of the damage in Charleston County, while coastal represents another 46%. While significant for the county, these cumulative losses represent 21% of the state's total overall, but 18% of the state's total damages related to hurricane/tropical storms, and 84% of the state's losses due to coastal hazards.

Hazard	Total Damage (in 2008 dollars)	Percent of State
Coastal	$872,926,747	84.62%
Drought	$14,201,478	2.28%
Flooding	$8,914,096	5.99%
Hail	$1,820,459	1.83%
Heat	$11,286,643	2.26%
Hurricane/ Tropical Storm	$964,098,174	18.20%
Lightning	$2,353,700	4.65%
Severe Storm/ Thunder Storm	$3,071,684	1.51%
Tornado	$5,720,430	2.51%
Wildfire	$334,042	2.18%
Wind	$14,844,294	10.58%
Winter Weather	$14,120,915	1.63%
Charleston - Total	**$1,913,692,663**	**20.80%**

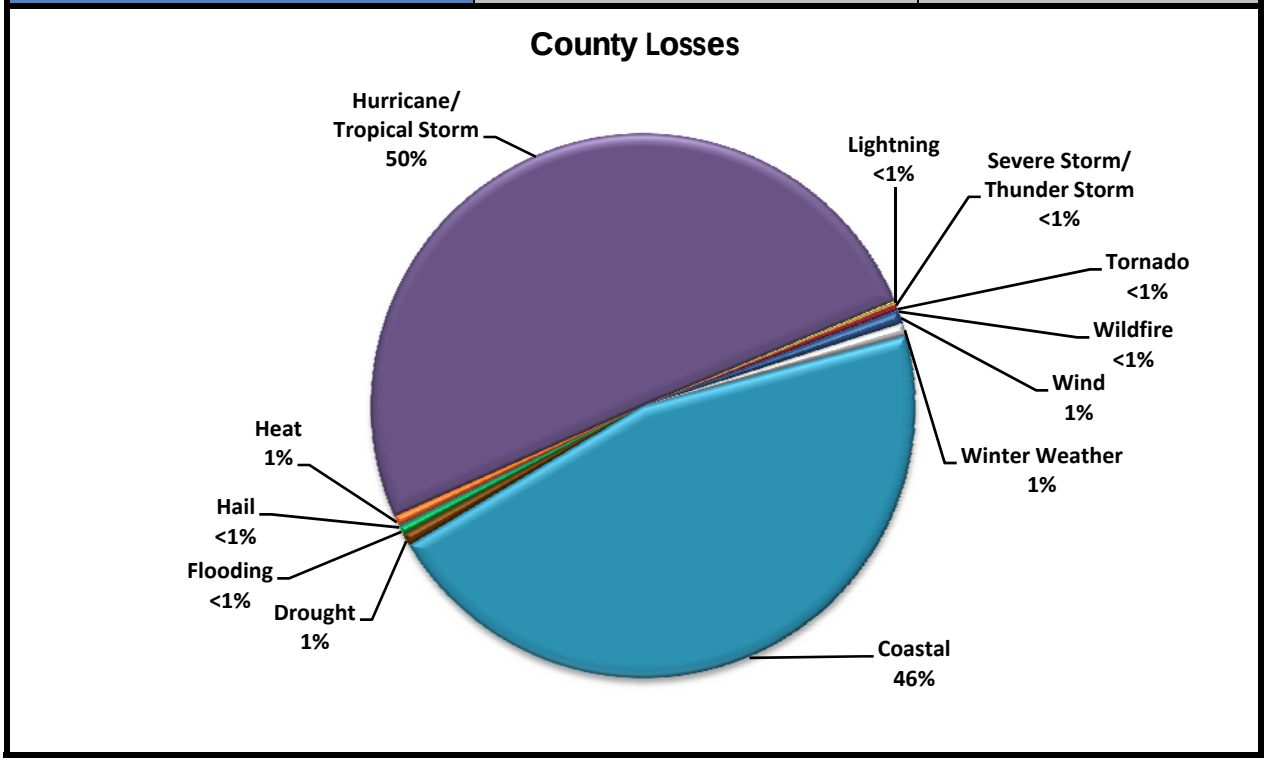


FIGURE 3. Historic Hazard Event Damages (property and crop) between 1960 and 2008 for Charleston County, SC.